



Soil in Urban Environments

Every bit of earth is covered in soil; some is just covered up by something else. There is soil underneath all of the buildings in your city or town. And, understanding soil is an important part of deciding where different types of structures can be built.

Soils that are good for supporting homes, buildings, bridges, and more have many of the following properties. They:

- allow water to enter and move through the ground (rather than puddle or run off);
- keep their shape during wetting and drying cycles (rather than cracking); and,
- support weight (rather than settling or sinking under a building).

Because so much of the soil cities and towns are covered by buildings, roads, or parking lots, the parts that are not covered have to work extra hard to provide ecosystem services such as water filtering, and supporting plant life and animal habitats. Sometimes, the amount of rain falling is more than the small amounts of exposed soil can handle. This is part of the reason why we see more flooding as urban areas spread. One way to help alleviate this problem is by creating **rain gardens**. These gardens are specially designed with soil and plants that can absorb and filter large amounts of rain and water that runs off of building and road surfaces. These rain gardens help make the city more attractive too.

Even in a city covered with buildings, most of us still have access to soil in our yards, playgrounds, and parks. One wonderful way to take advantage of soil is to grow a garden, either in your yard or at a community garden. The nutrients in the soil will enter the fruit and vegetables grown there and provide you with delicious and healthy food. And, think about how soil supports life, besides gardens, in the city. At your next picnic, observe the ants and other insects making their homes in the ground. During your next soccer game, think how much more difficult the game would be if the ground was sloped or covered in puddles. Think about all the beautiful trees, growing in the soil, that provide shade and oxygen for you and your city or town.



An underused space is transformed into a garden.

Managing Urban Soils

Because the limited amount of soil in an urban environment works so hard, we have to protect it. Common soil degradation concerns such as contamination and erosion can happen in cities. Some soils were contaminated by factories a long time ago and have chemicals in them that make it difficult for plants and animals to live. These chemicals might also get passed to the water that moves over or through the soil. Areas with soil contamination are likely to be remediated, or cleaned-up, by the city or federal government. One technique they use is **phytoremediation**, or clean-up by plants. Some plants take-up and use the pollutant similar to how they take up nutrients. Once the pollutant becomes part of the plant, the plant can be removed from the site, taking the pollutant with it. In other cases, chemical and biological reactions happening between the plant roots, soil, and soil microorganisms help to break down the pollutant.

Smaller areas can also become contaminated by urban residents and need to be understood and managed by the community. One common example is that gas and oil can leak from cars onto roads and parking lots and then get washed to nearby soils or streams by rain. Other chemical concerns come from everyday items (such as grass fertilizer or sidewalk salt) being used either in excess or where they aren't needed. You can help by making sure to only use these items when needed, follow the package directions, and clean-up spills immediately.

Surprisingly, erosion can also be a big problem in cities and towns. Not only is soil lost from the site where erosion occurred, but the soil then ends up somewhere else, usually not where it is meant to be. A playground or park covered in mud is no fun. A street covered in mud is slippery and dangerous. A lake with soil sediment from runoff is no fun either. One of the biggest sources of eroded soil material is construction sites. When heavy equipment disturbs and displaces large amounts of soil, it makes it easier for wind or water to carry the soil particles away. Here are some suggestions for reducing erosion that can be used at large construction sites or in your backyard:

- only disturb the area you are currently working on (rather than the entire site);
- keep soil covered with grass, straw, mulch, or gravel (rather than have bare ground exposed to wind and rain); and,
- use barriers, such as silt fences or straw bales, to keep soil and water from leaving site.

Recap

Urban life requires soil, that soil just isn't always visible. Soil is responsible for physically supporting buildings and other structures as well as absorbing water and providing habitat for trees and animals. It is important to take care of the soil in and around cities.



Urban life requires soil.



Construction sites can be the source of eroded material.